

University of Windsor Scholarship at UWindsor

Odette School of Business Publications

Odette School of Business


2016

University Sustainability Reporting: A review of the literature and development of a model.

Alan J. Richardson
University of Windsor

Meghan D. Kachler
University of Windsor

Follow this and additional works at: <http://scholar.uwindsor.ca/odettepub>

 Part of the [Accounting Commons](#), and the [Business Administration, Management, and Operations Commons](#)

Recommended Citation

Richardson, Alan J. and Kachler, Meghan D.. (2016). University Sustainability Reporting: A review of the literature and development of a model.. *Handbook on Sustainability in Management Education*..
<http://scholar.uwindsor.ca/odettepub/101>

This Contribution to Book is brought to you for free and open access by the Odette School of Business at Scholarship at UWindsor. It has been accepted for inclusion in Odette School of Business Publications by an authorized administrator of Scholarship at UWindsor. For more information, please contact scholarship@uwindsor.ca.

University Sustainability Reporting: A review of the literature and development of a model.

Alan J. Richardson
Odette Research Chair
Odette School of Business
University of Windsor
Windsor Canada.

Meghan D. Kachler
Outstanding Scholar
University of Windsor
Windsor Canada.

Contact: Dr. Alan J. Richardson, ajr@uwindsor.ca

October 13, 2015

For inclusion in

Handbook on Sustainability in Management Education.
Editors: Jorge A. Arevalo, William Paterson University
Shelley F. Mitchell, University of New Hampshire
Handbook Publisher: Edward Elgar Publishing Inc. www.e-elgar.com
Publication is anticipated for Spring 2016.

Work on this Chapter was supported by the Outstanding Scholars Program, University of Windsor. The first author would also like to acknowledge the students in his 2014 sustainability reporting course at the Odette School of Business, University of Windsor who focused their project work on the quality of university sustainability reports. An earlier version of the Chapter was presented to the Odette School of Business Sustainability Symposium; the authors are grateful to participants for their comments. We also acknowledge the helpful comments of the Handbook editors and reviewers.

Abstract

Many universities have made a commitment to improving the sustainability of their campuses however only a small number report to stakeholders on their sustainability performance to allow accountability and the quality of the reports issued varies widely. This Chapter reviews studies of sustainability reporting by universities and identifies the factors that have been associated with the decision to report on sustainability and the quality of those reports. Most of the existing empirical work on sustainability reporting by universities is case-based. We critique this literature and identify areas in need of conceptual and empirical clarification. We provide a model, hypotheses, constructs and proxies to support large sample research on sustainability reporting by Universities.

Keywords: sustainability, higher education, sustainability reporting, model of sustainability reporting, large sample research in sustainability, sustainability strategy, sustainability reporting quality.

This Chapter reviews the existing, mostly case-based, literature on sustainability reporting by universities in order to develop a grounded model of the decision to release a sustainability report and the quality of the information released. This model is intended to guide large-scale empirical work on sustainability reporting. Such studies can improve our understanding of the factors that encourage universities to create accountability for sustainability and to identify pressure points where stakeholder groups can improve the transparency of universities as universities fulfil their duty to be role models and sources of innovation in society. The model developed addresses the links between the existence and quality of sustainability reporting and organizational strategy, organizational capabilities, stakeholder demands and the university's sustainability performance.

The link between reporting to stakeholders and corporate compliance with social values is long-standing. Louis Brandeis (1914) recommended “publicity” – what we might now call transparency or accountability – as the means to prevent organizations from acting in violation of social norms: “Publicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants; electric light the most efficient policeman” (Brandeis, 1914: 92). This approach has become the mainstay of corporate governance and the regulation of public corporations in many jurisdictions (Stiglitz, 2000; Rock, 2001). For example, the annual report and financial statements issued by public companies are closely scrutinized by stakeholders and regulators, and failure to disclose material events can result in lawsuits or regulatory intervention. As the expectations of corporate performance expanded to include social and environmental dimensions, companies expanded their reporting to stakeholders to include documents such as corporate philanthropy reports, corporate social responsibility reports and, most recently, sustainability reports (Kolk, 2003). In most jurisdictions, reporting on performance beyond basic financial indicators is voluntary but growing in frequency and sophistication. Although the analogy between financial reporting and sustainability reporting must be used carefully (Etzion & Ferraro, 2010), the concept of information disclosure to allow stakeholder oversight remains the dominant model in this domain too (Brown *et al.*, 2009; Ceulemans *et al.*, 2014).

The demand for sustainability reporting extends well beyond public corporations. Public sector bodies and non-profits are also experiencing demands for more sustainable performance and stakeholders are pressing for the information to monitor this type of performance (Farneti & Guthrie, 2009). This reflects a general social acceptance of planetary limitations and the need to develop sustainable models of economic development (Rockstrom *et al.*, 2009). Universities, in particular, are seen as playing a key role in this movement. Universities are an important “institutional carrier” (Scott, 2003) of sustainability. They are regarded as role models in society, as sources of new knowledge and institutional entrepreneurship, and are intimately involved in training professionals who will become institutional carriers in their own right (Boyer, 1998; Sedlacek, 2013; Bekessy and Burgman, 2008; Karatzoglou, 2013). In spite of the pivotal role of universities in the creation of a sustainable society, their own sustainability performance has been questioned and the disclosure of their performance in achieving

sustainability is spotty (Fonseca *et al.*, 2011, p.23; Lozano, 2011; Alonso-Almeida *et al.*, 2014; Amaral *et al.*, 2015; Hinson *et al.*, 2015; León-Fernández and Domínguez-Vilches, 2015).

Given this combination of growing social expectations and variable levels of sustainability performance and reporting by universities, there is beginning to develop a literature that explores the factors that affect the decision by universities to report their performance and the quality of those reports (Hahn and Kahlen, 2013; Nelson *et al.*, 2003). This work will enable administrators and stakeholders to understand the obstacles that must be overcome for universities to achieve sustainability and to identify the pressure points to use to encourage greater disclosure of their progress. For the most part the existing literature is exploratory – based on single cases or small samples – but important factors explaining variation across universities are emerging. In this Chapter we use the existing literature on sustainability reporting by universities, supplemented with the literature on voluntary financial disclosure by companies, to develop a model of the decision by universities to report their sustainability performance and the quality of the reports that they release. Our hypotheses are summarized in Table 1.

[Table 1]

Our model is intended to guide large sample empirical work. We use the existing literature to identify the measurement and conceptual issues that need to be resolved to facilitate further research and suggest ways forward. Table 2 provides a list of concepts, proxies and examples of literature on sustainability in universities that have used these proxies (where available).

[Table 2]

Sustainability Performance

Organizations and their stakeholders have long been concerned with more than just economic performance (Sahlin-Andersson, 2006). Historically the literature has used a variety of terms to refer to organizations acting beyond a narrow economic self-interest including corporate philanthropy, corporate citizenship and corporate social responsibility. The most recent term to capture organizations' embeddedness in a broader life world is sustainability. The most common definition of sustainability as applied to organizations relies on two sources of inspiration. From the Brundtland (1987) report we have adopted the idea that sustainability involves "meeting the needs of the present without sacrificing the needs of future generations". From Elkington (1998) we have focused on the "triple bottom line" of business: i.e. economic, social and environmental performance¹. Combining these sources, we define

¹ In some cases this has been expanded to a quadruple bottom line by adding "governance" to the mix (another dimension added by some is "spirituality").

sustainability as achieving economic, environmental and social objectives to meet the needs of the present while not sacrificing the needs of future generations.

Some would claim that we have never achieved sustainability in corporate performance (Gray and Milne, 2002; Gray, 2010; Cho *et al.*, 2015). Rather sustainability has been used to refer to efforts to minimize the negative impacts of organizational activities on society and the environment but this is far from the ideal of leaving the options of future generations intact. This weak use of the concept of sustainability has found its way into the literature on sustainability in universities through Velazquez *et al.*, (2006, p. 812) who define a sustainable university as: “A higher educational institution, as a whole or as a part, that addresses, involves and promotes, on a regional or a global level, the minimization of negative environmental, economic, societal, and health effects generated in the use of their resources in order to fulfil its functions of teaching, research, outreach and partnership, and stewardship in ways to help society make the transition to sustainable lifestyles.” Regardless of the reality of corporate and university sustainability, there is an undeniable momentum towards providing stakeholders with information about corporate performance across a range of dimensions. If Brandeis (1914) was right, making this performance visible may, at least, be a first step to accountability and ultimately to achieving the ideal of sustainability.

Sustainability Performance of Universities

The concept of sustainability has different action implications depending on the context in which this goal is pursued. Many measurement systems or checklists for assessing sustainable performance by Universities have been developed (Posner and Stuart, 2013; Disterheft *et al.*, 2012; Gomez *et al.*, 2014; Wright, 2002). The Campus Sustainability Assessment Framework, for example, grew out of an initiative by the Sierra Club to encourage universities to improve on-campus sustainability (Cole and Wright, 2003). This framework has been used by several universities to structure their sustainability programs and reports. The framework provided 175 indicators of sustainability focusing on people and the ecosystem (Beringer, 2006). This framework however has been abandoned by the Sierra Club in favour of the Global Reporting Initiative (GRI) standards for reporting even though the GRI standards may not be completely appropriate for this sector (Dumay *et al.*, 2010).

The Association for the Advancement of Sustainability in Higher Education (AASHE) created the STARS system (Sustainability Tracking, Assessment & Rating System™) to facilitate self-reports of sustainability performance by universities and to identify areas for performance improvement (see <http://www.aashe.org/about>). The STARS system has been adopted by 525 universities across the world (as of March 2015) (although the majority are in North America). The AASHE maintains a database of self-report sustainability performance measures that are intended to allow universities to benchmark their performance against their peers but, as of March 2015, only 369 had submitted data. Appendix A provides a summary of the dimensions used in the STARS system. This system captures the broad role of universities within the sustainability movement and hence includes measures of educational and research

contributions to sustainability in addition to indicators capturing the “triple bottom line” performance of universities.

The STARS system provides the best currently available data on sustainability performance by universities. This system uses expert advice to weight the importance of different activities and then provides a score on each dimension and on an aggregate basis that reflects actual performance. The decision to participate in STARS demonstrates a university's commitment to sustainability as the process involves collecting extensive data accompanied by an affirmation attesting to the accuracy of the information (Wigmore and Ruiz, 2010). The weakness is that the data are self-report but if they are included in an audited sustainability report, then, presumably, the reliability of the data would be subject to tests and reported in the assurance statement. This issue will be discussed again below in connection to the quality of sustainability reports.

As we will argue below, sustainability performance and sustainability reporting are independent and care must be taken to separate these dimensions. For example, many universities participate in the STARS system as a way of benchmarking their performance without intending to release equivalent information publicly.

Sustainability Reporting

In generic terms we define a sustainability report as the communication of information regarding the sustainability performance of an organization to its stakeholders by any media. This may take the form of a print media standalone report, an online presentation of sustainability information or the inclusion of sustainability information as a clearly defined subsection² of another report to stakeholders (for example as part of an annual report). The purpose of a sustainability report is to provide stakeholders with sufficient information to hold the organization accountable for its sustainability performance.

Theoretically, as diagrammed in Figure 1, a high quality sustainability report would reflect the underlying state of sustainability in an organization in an unbiased manner consistent with stakeholder demands for information. It is possible to have poor sustainability performance but provide complete disclosure of this state in a high quality report (Honest Laggards in Figure 1). Conversely it is also possible that a company with high quality sustainability performance could fail to convey this information to stakeholders in a poor quality (or absent) sustainability report (Hidden Gems in Figure 1). The most likely situation, however, is that sustainability performance is positively correlated with reporting quality: firms with high sustainability performance are likely to also invest in high quality reporting while poor sustainability

² Since sustainability information includes economic performance, any financial report to stakeholders includes a subset of sustainability performance information but we regard sustainability reporting as a self-conscious attempt to communicate this information to stakeholders rather than the incidental release of a subset of information for other purposes.

performers are less likely to want to publicize their failings (Sustainability Leaders and Sustainability Lemons, respectively, in Figure 1). The idea of sustainability “lemons” is taken from the signalling literature (Akerlof, 1970). A “lemon” in the used car market is a car with reliability issues that an owner attempts to sell to someone else without disclosing what they know about the car. The existence of such information asymmetry about sustainability also raises the problem that poor sustainability performers may attempt to convince stakeholders that their performance is better than it really is through public relations documents pretending to be accurate sustainability reports (Adams, 2004) and there is a tendency for sustainability reports to have a good news bias (Velazquez *et al.*, 2005). In other words, we do anticipate a positive correlation between sustainability performance and the decision to release a sustainability report.). This is why the quality of reporting is so important (and often difficult to determine).

[Figure 1]

One of the unresolved issues in the literature on sustainability reporting is whether stakeholders can “see through” sustainability reports to the underlying sustainability performance of the organization (Wilmschurst & Frost, 2000). For those who believe in efficient information markets, in the absence of information directly from the organization, stakeholders will believe the worst about an organization’s performance. This creates an incentive for organizations to voluntarily release information and to ensure that the information is credible even if their performance is below expectations (Ronen and Yaari, 2002; Eng and Mak, 2003; Francis *et al.*, 2005). By contrast, much research on sustainability reporting assumes that stakeholders naively rely on sustainability reports to judge the performance of organizations and, hence, organizations have an incentive to bias their reports to emphasize good news and/or to only release a sustainability report if their performance is good (Adams, 2004). This possibility is reflected in the theory that sustainability reports are used to support legitimacy claims. The validity of these two conceptualizations needs to be explored in empirical work.

Factors Affecting the Decision by Universities to Release Sustainability Reports

Our dependent variables are the decision to release a sustainability report and the quality of that report. As we discussed above, measuring the quality of a sustainability report is problematic (we will discuss best practices below) but the existence of a sustainability report is more clear cut. Sustainability reports are typically released as standalone documents on university web sites. For example, Fonseca *et al.* (2011) outlined a sample of seven standalone sustainability documents released by Canadian universities in 2006-2008, all of which were published as PDF documents ranging from 20 to 305 pages. The documents are typically not released annually but use a longer periodicity (e.g. every three years). In corporate settings there is a movement towards creating “integrated reports” (Eccles & Krzus, 2010; Jensen and Berg, 2012; Richardson, 2015), which combine traditional financial reporting and sustainability reporting. This approach tends to narrow the focus of sustainability reports and to prioritize

financial performance such that discussion of sustainability is limited to those aspects that may help or hinder achievement of the strategic goals of the organization. We are not seeing this trend in university sustainability reporting yet (Fonseca *et al.*, 2011 but see Veltri & Silvestri, 2015), so we can measure the existence of a sustainability report as the web-based release of a standalone document covering the economic, environmental and social aspects of university performance.

We hypothesize that the decision to release a sustainability report will be related to its sustainability performance, stakeholder demands, strategic commitments and organizational capabilities as summarized in Table 1 and discussed further below. We identify key proxies for these constructs that have been used in the literature in Table 2.

Sustainability Performance

The relationship between sustainability performance and reporting is complex and contradictory hypotheses may be suggested.

1. **High Performance:** Based on the voluntary disclosure literature, universities with higher levels of sustainability performance are more likely to report on their performance (H1a). There is, in general, a bias in voluntary disclosure where negative information is suppressed and positive information is released particularly if there are no independent information about performance. This relationship will hold if stakeholders do not assume that the lack of information signals poor performance and hence punish organizations that do not report.
2. **Low Performance:** The literature based on legitimacy theory suggests that organizations with performance problems may release sustainability information to reduce the negative reaction of stakeholders to their performance and/or to disguise their poor performance through the release of biased information (H1b). An alternative explanation of the observed negative relationship between sustainability performance and reporting is that industries with potentially significant social and environmental impacts simply have more to report.

The contrary predictions outlined above suggest two empirical possibilities. First, the relationship between sustainability performance and the decision to report may be non-linear (U-shaped) with high and low performers being more likely to report than average performers (H1) although the underlying reasons for releasing a report may be quite different. Second, the relationship may be moderated by the nature of stakeholders or the efficiency of information markets. If stakeholders can read-through sustainability reports then the release of biased information will not have the desired effect. We therefore expect an interaction between stakeholder demands/stakeholder sophistication and sustainability performance on the decision to report (H2).

The complex relationship between sustainability performance and the decision to report is likely to vary over industries because of differences in potential social and environmental impacts due to the technologies used, resources consumed and nature of their products. In cross-sectional work, including industry dummies or normalizing the data by industry can correct for some of these issues. The issue may be less problematic when examining sustainability performance/reporting within a single industry such as higher education.

Stakeholder Demands

Stakeholders are a key part of sustainability reporting. The content of a sustainability report should reflect the information needs of stakeholders and stakeholder engagement processes are used to ensure the quality of the report (Brinkhurst and Ackerman, 2011). At a higher level of analysis, stakeholder demands are likely to influence the strategic direction of the university which, in turn, may affect the focus of the university on sustainability and the decision to release a sustainability report. Overall we hypothesize that the decision to release a sustainability report and the quality of that report will be related to the existence of stakeholder demands (H3).

We identify two groups of stakeholders that have been shown to be particularly influential.

- 1. Student Activism:** students are a key stakeholder of universities and their actions on campus can sway administrative decisions (Helferty and Clarke, 2009). Wright (2003), for example, credits improved sustainability in many educational institutions to bottom-up pressure from concerned and dedicated students requesting changes in organizational policies and practices. There are many student groups dedicated to promoting sustainability on campus and in society. These may be specific to a given campus or part of a broader network of clubs such as NetImpact and the Sierra Club. The Sierra Club, in particular, was active in creating guidelines for sustainability performance measurement and reporting by Universities³. Beringer (2006) presents examples of student-led initiatives, with specific focus on the Sierra Youth Coalition Sustainable Campuses project and its' campus sustainability assessment framework which has been used to guide sustainable development and auditing. We hypothesize that if these clubs are active on campus then it is more likely that university administrations will be aware of sustainability issues and to provide data for stakeholders to evaluate their performance (H3a).
- 2. Endowment Funds:** university endowment funds have been a target of activists on both social and environmental issues (e.g. activists have advocated disinvestment from stocks linked to weapons, alcohol, gambling, apartheid, etc.). Consistent with this, Stafford (2011) found that larger and wealthier institutions are more likely to implement sustainability practices than smaller, less well-endowed institutions. We

³ See <http://vault.sierraclub.org/sierra/201309/coolsschools/complete-rankings.aspx>

hypothesize that the larger the university's endowment fund the more closely activists will monitor University sustainability and the more likely universities are to release sustainability reports (Willis, 2003) (H3b).

Strategic Commitments

Assuming that universities are rational actors, the decision to release a sustainability report should be related to the organization's commitment to sustainability in its overall strategy (H4) (Thompson and Green, 2005). Why the university makes this commitment is beyond the scope of this Chapter but we assume that it is related to stakeholder demands and the university's market positioning (Tolbert, 1985; Oliver, 1991; Etherington & Richardson, 1994; Suchman, 1995; Larrán *et al.*, 2015).

We identify two signals of a university's strategic commitment to sustainability.

- 1. Convention Signatory:** One approach by activists to encouraging universities to improve sustainability is to encouraging universities to sign a document supporting sustainability on campus (Lozano *et al.*, 2013). For example, the Taillores Declaration⁴, signed by over 400 universities world-wide since 1990, reflects a commitment by those universities to include sustainability in educational programs, developing environmental literacy among students and social outreach to encourage sustainability in society. Signing Conventions such as this would indicate a strategic commitment to sustainability (Grinsted, 2011; Grindsted & Holm, 2012). This expectation has been used in case studies to critique the actions of universities who sign such declarations and do not follow through with specific actions. For example, despite being a leader in signing declarations, RMIT University failed to adequately translate their basic commitments into action (Bekessy *et al.*, 2007). However, success stories also exist. The University of British Columbia was among the first to sign the Taillores Declaration and has since signed various partnerships and commitments, demonstrating improved sustainability (Bilodeau *et al.*, 2014). We hypothesize that universities that sign sustainability declarations are more likely to release sustainability reports (H4a).
- 2. Research and Teaching:** A clear commitment to sustainability is the creation of teaching and research programs on sustainability (Gumport, 2000; Adams, 2013; McGibbon & Van Belle, 2015). For example, TERI University in India implemented an educational approach to sustainability through a M.Sc. Environmental Studies and Resource Management program which integrates sustainability issues throughout curriculum, research, and sustainable operations such as building green facilities on campus (Jain *et al.*, 2013). The development and staffing of degree programs and research centers represents a significant commitment of resources by a university and we hypothesize that this would be positively associated with creation of a sustainability report because

⁴http://www.ulsf.org/programs_talloires.html

of the internal pressure from these staff, the capabilities that these staff bring to the university to prepare sustainability reports, and to signal the university's commitment to sustainability to potential donors and students associated with these programs (H4b).

Organizational Capabilities

Producing a high quality sustainability report requires information systems and staff capable of collecting, analyzing, synthesizing and disclosing sustainability performance data (H5). These resource requirements mean that smaller universities are less likely to be able to produce the data needed particularly if the reporting function is not tied to donors or recruitment.

1. **Size:** the voluntary disclosure literature consistently finds a positive relationship between the size of organizations and the amount of voluntary disclosure (Bujaki and Richardson, 1997). Similarly, a study of Canadian firms found that companies that issue corporate social responsibility reports are significantly larger in terms of assets, sales volume and profit (Thorne *et al.*, 2014). This is most likely a reflection of the resources needed to collect and disclose such information. Paradoxically, however, the literature also finds that the value of the information to stakeholders is inversely related to the size of the organization. This relationship reflects the broader information environment of firms. Large firms are more likely to be followed by journalists and activists, they are more likely to have formal public relations programs and they may have higher statutory disclosure requirements triggered by size thresholds in legislation. In this context a sustainability report is more likely to have incremental information content for smaller universities while some form of the information is likely to be in the public domain through other channels with large universities. We hypothesize that there will be a positive association between the size⁵ of a university and the decision to release a sustainability report (H5a).
2. **Staff:** As a corollary to the idea that a university's strategic commitment to sustainability increases the likelihood of releasing a sustainability report, this relationship will be mediated by having staff dedicated to implementing sustainability on campus and hence having the ability to document that performance. This organizational capability is demonstrated through case studies which have analyzed the institutionalization of sustainability at The University of British Columbia, The University of Calgary, and Carleton University. Each institution has a dedicated sustainability office with staff members dedicated to the development, coordination, and implementation of sustainability initiatives, including sustainability reports (Rosenbloom, 2010). We

⁵ "Size" can be operationalized in many ways such as number of students, total revenue etc. Given the mechanism we hypothesize connecting size and sustainability reporting a measure of staff or financial resources normalized by the size of the student body may be the appropriate measure. The use of a normalized measure would control for other demands on resources.

hypothesize that having an office⁶ dedicated to sustainability on campus will increase the likelihood that a university will release a sustainability report (H5b).

Sustainability Reporting Quality

We define the quality of a sustainability report as the extent to which the report provides valid and reliable data to meet stakeholder information needs. This definition requires that we specify the decision-model that stakeholders use to evaluate the organization and that the data reported is a reliable and valid indicator of the dimensions of sustainability performance used in that model. In the financial reporting literature, the quality of financial statements has been related to economic models of equity valuation providing clear criteria to judge quality (i.e. reporting quality is evaluated by the extent to which the reports provide information theoretically and empirically related to stock market valuations). The literature on sustainability reporting has not reached consensus on an independent benchmark for sustainability reporting quality.

A common approach to measuring the quality of a sustainability report has been to compare the categories of information disclosed against a standard that mandates certain disclosures. There are multiple standard setting bodies that have produced checklists of sustainability disclosures as reviewed above. The most common standards used in the empirical literature on publicly listed companies are those produced by the Global Reporting Initiative.

The use of the GRI reporting standards and other checklists has created a bias in the literature towards measuring report quality by the quantity of items reported (e.g. Daub, 2007; Skouloudis *et al.*, 2009). The GRI standards (up until the release of the 4th generation standards in 2013) provided a checklist of the information that a generic set of stakeholders might find useful from a generic company. Two issues arose with this approach. First, companies would be scored as having higher quality reports by simply commenting on each of the indicators listed in the GRI standards. In many cases these indicators would have no relevance to the company preparing the report. For example, a bank might note that it does not threatened endangered species in its disclosures even though stakeholders would have no reason to believe that this might be an issue. This “disclosure” would be counted as improving the quality of the report. Second, a company that matches its disclosures to the areas of concern to stakeholders would be scored lower on report quality because of the small number of indicators disclosed.

The fourth generation of standards released by the GRI has shifted to a focus on materiality rather than consistency in disclosures across organizations. While this will make sustainability reports easier for stakeholders to read and understand, it does underscore the error of using the quantity of disclosures as a proxy for the quality of disclosure. One possible approach is to

⁶ The existence of such an office would be a minimum indicator; the number of staff involved or the budget of this office would provide a finer indicator of its potential influence.

normalize disclosure quantity based on industry norms but ultimately a more subjective approach may be needed.

The STARS inventory in Appendix A provides a similar checklist to the GRI.3 standards but specifically geared to universities. When work on disclosure quality is limited to a particular industry (*ceteris paribus*), then a checklist that captures the meaning of sustainability for that industry may be a valid way of capturing disclosure quality. Alternatively, independent indicators of reporting quality may be used. For example, there are several awards for sustainability quality including the CERES/ACCA Sustainability Reporting Awards. This award is adjudicated by a panel of experts using three criteria: completeness, credibility and communication⁷. This approach however provides only a categorical indicator of quality (either an organization did or did not win an award) and the probability of winning is very small compared with the potential population. In addition, most awards require the company to self-select as a candidate raising issues with bias in the sample of winning companies. Some organizations have begun preparing independent rankings of sustainability reporting by universities that may be useful in large sample research (e.g. the Green Report Card, <http://www.greenreportcard.org/> which unfortunately stopped data collection in 2012).

In addition to content issues, quality is also correlated with credibility. Credibility is added to a report by the process through which the information is assembled and verified. A key process is to have an independent actor audit the report to ensure that the information released reflects the underlying performance of the company. In sociological terms, this constitutes an immanent critique of sustainability reports. In principle, every disclosure in a sustainability report should be a reliable and valid indicator of some dimension of sustainability performance. The quality of the report can thus be assessed by using independent information to verify the disclosures in the report. Adams (2004), for example, undertakes this task for a single company. More generally, in some countries the level of government monitoring of point-sources of pollution provides independent data for assessing environmental disclosures. The audit process is intended to provide a similar check on the procedures used within the company to generate the information reported (Lenzen *et al.*, 2004). Audit processes however tend to focus on the reliability of the information rather than its validity as an indicator of sustainability performance (i.e. whether the information reported is without substantial error but not whether the information is useful to stakeholders).

We hypothesize that sustainability report quality will be related to two aspects of the reporting process.

1. **Assurance of Sustainability Report Quality:** In financial reporting it is well established that the credibility of reports is enhanced by the use of an independent audit. In order to provide assurance, typically the auditor relies on standards that specify the information to be disclosed and the way that information is measured. University

⁷ See <http://www.ceres.org/awards/reporting-awards/judging-criteria>

sustainability reports are increasingly based on disclosure standards set by the Global Reporting Initiative but these may not provide auditable directions (Wallage, 2000).

- a) Scope of the audit: audits are based on engagement letters that specify the scope of the audit. It is not uncommon for organizations to limit the auditor's review to specific locations (e.g. international campuses may be excluded), or to specific indicators (e.g. those that are quantitative), or to a review of the process rather than the substance of disclosure. The broader the scope of an audit, the higher the quality of the report (H6a).
- b) Reputation of the Auditor: since sustainability reports are voluntary, audits are also voluntary and a variety of auditors have been used including a stakeholder review panel, in-house experts or independent auditors (from a variety of background but most often engineering or accounting). The greater the independence and competence of the auditor, the more credibility that stakeholders are likely to attribute to the sustainability report (H6b).

2. **Stakeholder Engagement:** the quality of a sustainability report depends on the extent to which stakeholder concerns are reflected in the data provided (O'Dwyer & Owen, 2005; O'Dwyer *et al.*, 2005). This is usually ensured by having stakeholders involved early in the process to ensure the right indicators are used, the data is regarded by stakeholders as credible and data are presented in a meaningful and understandable way. The use of stakeholder engagement processes signals the higher quality of reporting (H7).

Factors Affecting the Quality of Sustainability Reporting by Universities

The quality of a sustainability report is likely to be affected by the same factors discussed above that affect the decision to release a report. However, we can only observe the quality of a report after the report has been released. This means that empirical examination of these relationships will have to be explored with a smaller sample and this sample will be left-censored (i.e. we will not be able to observe sustainability reports where our model predicts a low probability of a report being issued). These issues may limit the extent to which we can empirically explore the quality of sustainability reports.

A key advantage of using report quality as a dependent variable is the ability to differentiate between the competing hypotheses regarding the association between sustainability performance and the decision to release a sustainability report discussed above. We hypothesize that low (high) levels of sustainability performance will be associated with low (high) quality sustainability reports (*ceteris paribus*) (H2).

Discussion

The existing literature on sustainability disclosure has not, for the most part, been theoretically driven. As a result the factors identified as encouraging the production and release of high quality sustainability reports reflect a diverse foundation. First, sustainability is seen as an emerging “product” of universities and sustainability reporting can be used to recruit students and donors interested in that product line (economic signalling). Second, sustainability is recognized as an emerging normative issue within the institutional environment in which universities operate and sustainability reports are used to manage these institutional norms (institutional isomorphism). Third, to the extent that universities are dependent for resources on external bodies that link funding with sustainability, universities will use sustainability reports to manage their legitimacy within this network (resource dependency). It is likely that the decision by a university to release a sustainability report is empirically overdetermined but it is time to begin exploring the relative strength of alternative theories (Platt, 1964; Cooper and Richardson, 1984).

Notwithstanding the theoretical diversity of the factors identified, there is an emerging consensus that the decision to release a sustainability report is related to the strategic commitment of the university to sustainability, its organizational capabilities to produce these reports, and the level of its sustainability performance. Once the decision to release a report has been made, the quality of the report (proxied by external ratings of the disclosures and inventories of industry-specific disclosure adequacy) is also likely to be influenced by these variables. The literature has developed to the point where large sample studies would help to clarify the strength and contingencies of the relationships identified in existing case studies. We have used the existing literature to identify useful proxies for each of the constructs that might be reasonably built into a model to be tested (or recommended proxies where current work is lacking).

One of the notable problems in moving from the predominately case-based work reviewed in this Chapter to large-sample studies is the lack of a well-specified definition of quality in this context. There has been a tendency to proxy the quality of reporting with the quantity of reporting by developing a checklist of potential disclosure items and simply counting how many of these items appear in a sustainability report. This approach has well known limitations most notably it rewards organizations for the release of information that may be irrelevant to stakeholders and fails to distinguish between substantive and trivial disclosures on any item. In the voluntary disclosure literature in accounting, quality can be related to independent outcomes for the organization such as cost-of-capital or bid-ask spreads in equity markets, or tied to models that equate quality with a reduction in managerial discretion over disclosures. This is an area that requires further theoretical development.

Our call for large scale empirical work on sustainability reporting by universities reflects a natural progression from the case-based work that has been undertaken so far to studies that can identify the generalizable factors affecting reporting. These results may help practitioners to better understand the obstacles to high quality sustainability reporting in this sector and help activists to identify the paths that might be used to influence universities to make a

commitment to sustainability and to provide the data needed to hold universities accountable to this commitment.

Conclusion

This Chapter is designed to encourage and provide a model for large-sample studies of sustainability reporting by universities. It identifies two key dependent variables – the decision to release a report and the quality of the report – and uses the existing literature on sustainability reporting by universities and on voluntary accounting disclosures by organizations generally to develop a model and identify potential proxies for independent variables that could be used in large sample work. The Chapter identifies methodological, empirical and theoretical issues in the existing literature that need to be resolved in future work. For example, the literature consistently confounds the quantity of sustainability disclosures with the quality of those disclosures; has not reconciled inconsistent predictions about the relationship between sustainability performance and the decision to release a sustainability report; and, has not developed theoretically consistent models to guide empirical work. Our model will help practitioners to identify obstacles to providing high quality sustainability reports and help activists to identify paths of influence to encourage universities to commit to sustainable performance and to providing the data to hold them accountable for those commitments.

References:

- Adams, C. (2004), 'The ethical, social and environmental reporting-performance portrayal gap', *Accounting, Auditing & Accountability Journal*, **17** (5), 731-757.
- Adams, C. (2013), 'Sustainability reporting and performance management in universities: challenges and benefits', *Sustainability Accounting, Management and Policy Journal*, **4** (3), 384-392.
- Akerlof, G. A. (1970). The market for "lemons": Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, **84** (3), 488-500.
- Alonso-Almeida, M., F. Marimon, F. Casani, and J. Rodriguez-Pomeda (2014), 'Diffusion of sustainability reporting in universities: current situation and future perspectives', *Journal of Cleaner Production*, in press
[doi:10.1016/j.jclepro.2014.02.008](https://doi.org/10.1016/j.jclepro.2014.02.008) (accessed 28 November 2014).
- Amaral, L. P., Martins, N., & Gouveia, J. B. (2015). Quest for a sustainable university: a review. *International Journal of Sustainability in Higher Education*, **16**(2), 155-172.
- Bekessy, S. and M. Burgman (2003), 'Universities and sustainability', *Tela: Environment, Economy and Society*, **11** (1), 1-41.
- Bekessy, S.A., K. Samson, and R.E. Clarkson (2007), 'The failure of non-binding declarations to achieve university sustainability: a need for accountability', *International Journal of Sustainability in Higher Education*, **8** (3), 301-316.

- Beringer, A. (2006), 'Campus sustainability audit research in Atlantic Canada: pioneering the campus sustainability assessment framework', *International Journal of Sustainability in Higher Education*, **7** (4), 437-455.
- Bilodeau, L., J. Podger, and A. Abd-El-Aziz (2014), 'Advancing campus and community sustainability: strategic alliances in action', *International Journal of Sustainability in Higher Education*, **15** (2), 157-168.
- Boyer, E.L. (1996), 'The scholarship of engagement', *Journal of Public Service and Outreach*, **1** (1), 11-20.
- Brandeis, L. D. (1914/2009), *Other People's Money and How The Bankers Use It*, New York, NY, USA: Cosimo, Inc.
- Brinkhurst, R. and M. Ackerman (2011), 'Achieving campus sustainability: top-down, bottom-up, or neither?' *International Journal of Sustainability in Higher Education*, **12** (4), 338-354.
- Brown, H., M. de Jong, and D. Levy (2009), 'Building institutions based on information disclosure: lessons from GRI's sustainability reporting', *Journal of Cleaner Production*, **17** (6), 571-580.
- Brundtland, G. H. (1987), *Report of the World Commission on Environment and Development: Our Common Future*, New York, NY, USA: United Nations.
- Bujaki, M. L., & A.J. Richardson (1997), 'A citation trail review of the uses of firm size in accounting research', *Journal of Accounting Literature*, **16**, 1-27.
- Ceulemans, K., I. Molderez, and L. Van Liedekerke (2014), 'Sustainability reporting in higher education: a comprehensive review of the recent literature and paths for further research', *Journal of Cleaner Production*, In Press doi:[10.1016/j.jclepro.2014.09.052](https://doi.org/10.1016/j.jclepro.2014.09.052) (accessed 28 November 2014).
- Cho, C. H., Laine, M., Roberts, R. W., & Rodrigue, M. (2015). Organized hypocrisy, organizational façades, and sustainability reporting. *Accounting, Organizations and Society*, **40**, 78-94.
- Cole, L. and T. Wright (2003), *Assessing Sustainability on Canadian University Campuses: Development of a Campus Sustainability Assessment Framework*, Canada: Royal Roads University.
- Cooper, W. H. and A.J. Richardson (1986), 'Unfair comparisons', *Journal of Applied Psychology*, **71** (2), 179-184.
- Daub, C. H. (2007), 'Assessing the quality of sustainability reporting: an alternative methodological approach', *Journal of Cleaner Production*, **15** (1), 75-85.
- Disterheft, A., S.S. Ferreira da Silva Caeiro, M.R. Ramos, and U.M. de Miranda Azeiteiro (2012), 'Environmental management systems (EMS) implementation processes and practices in European higher education institutions – top-down versus participatory approaches', *Journal of Cleaner Production*, **31** (1), 80-90.
- Dumay, J., J. Guthrie, and F. Farneti (2010), 'GRI sustainability reporting guidelines for public and third sector organizations: a critical review', *Public Management Review*, **12** (4), 531-548.
- Eccles, R. G. and M.P. Krzus (2010), *One Report: Integrated Reporting for a Sustainable Strategy*, Hoboken, NJ, USA: John Wiley & Sons.
- Elkington, J. (1998), *Cannibals with Forks: The Triple Bottom Line of Sustainability*, Gabriola Island, BC, Canada: New Society Publishers.

- Eng, L. L. and Y.T. Mak (2003), 'Corporate governance and voluntary disclosure', *Journal of Accounting and Public Policy*, **22** (4), 325-345.
- Etherington, L. D. and A.J. Richardson (1994), 'Institutional pressures on university accounting education in Canada', *Contemporary Accounting Research*, **10** (S1), 141-162.
- Etzion, D. and F. Ferraro (2010), 'The role of analogy in the institutionalization of sustainability reporting', *Organization Science*, **21** (5), 1092-1107.
- Farneti, F. and J. Guthrie (2009), 'Sustainability reporting by Australian public sector organisations: why they report', *Accounting Forum*, **33** (2), 89-98.
- Fonseca, A., A. MacDonald, E. Dandy, and P. Valenti (2011), 'The state of sustainability reporting at Canadian universities', *International Journal of Sustainability in Higher Education*, **12** (1), 22-40.
- Francis, J. R., I.K. Khurana, and R. Pereira (2005), 'Disclosure incentives and effects on cost of capital around the world', *The Accounting Review*, **80** (4), 1125-1162.
- Gómez F., C. Saez-Navarrete, S. Lioi, and V. Marzuca (In Press), 'Adaptable model for assessing sustainability in higher education', *Journal of Cleaner Production*, [doi:10.1016/j.jclepro.2014.07.047](https://doi.org/10.1016/j.jclepro.2014.07.047) (accessed 11 December, 2014).
- Gray, R. (2010), 'Is accounting for sustainability actually accounting for sustainability... and how would we know? An exploration of narratives of organisations and the planet', *Accounting, Organizations and Society*, **35** (1), 47-62.
- Gray, R. and M. Milne (2002), 'Sustainability reporting: who's kidding whom?', *Chartered Accountants Journal of New Zealand*, **81** (6), 66-70.
- Grindsted, T. and T. Holm (2012), 'Thematic development of declarations on sustainability in higher education', *Environmental Economics*, **3** (1), 32-40.
- Grindsted, T. (2011), 'Sustainable universities – from sustainability in higher education declarations to national law', *Journal of Environmental Economics*, **1** (1), 29-36.
- Gumport, P. J. (2000), 'Academic restructuring: organizational change and institutional imperatives', *Higher Education*, **39** (1), 67-91.
- Hahn, R. and M. Kühnen (2013), 'Determinants of sustainability reporting: a review of results, trends, theory, and opportunities in an expanding field of research', *Journal of Cleaner Production*, **59**, 5-21.
- Helferty, A. and A. Clarke (2009), 'Student-led campus climate change initiatives in Canada', *International Journal of Sustainability in Higher Education*, **10** (3), 287-300.
- Hinson, R., Gyabea, A., & Ibrahim, M. (2015). Sustainability reporting among Ghanaian universities. *Communicatio*, **41**(1), 22-42.
- Jain, S., P. Aggarwal, N. Sharma, and P. Sharma (2013), 'Fostering sustainability through education, research and practice: a case study of TERI University', *Journal of Cleaner Production*, **61**, 20-24.
- Jensen, J.C. and N. Berg (2012), 'Determinants of traditional sustainability reporting versus integrated reporting. An institutionalist approach', *Business Strategy and the Environment*, **21** (5), 299-316.
- Karatzoglou, B. (2013), 'An in-depth literature review of the evolving roles and contributions of universities to education for sustainable development', *Journal of Cleaner Production*, **49**, 44-53.

- Kolk, A. (2003), 'Trends in sustainability reporting by the Fortune Global 250', *Business Strategy and the Environment*, **12** (5), 279-291.
- Larrán, M., Herrera, J., & Andrades, F. J. (2015). Measuring the linkage between strategies on sustainability and institutional forces: an empirical study of Spanish universities. *Journal of Environmental Planning and Management*, 1-26.
- Leon-Fernandez, Y., & Domínguez-Vilches, E. (2015). Environmental management and sustainability in higher education: the case of Spanish universities. *International Journal of Sustainability in Higher Education*, **16**(4): 440-455.
- Lenzen, M., C.J. Dey, and S.A. Murray (2004), 'Historical accountability and cumulative impacts: the treatment of time in corporate sustainability reporting', *Ecological Economics*, **51** (3), 237-250.
- Lozano, R. (2006), 'Incorporation and institutionalization of SD into universities: Breaking through barriers to change', *Journal of Cleaner Production*, **14** (9), 787-796.
- Lozano, R. (2011). 'The state of sustainability reporting in universities'. *International Journal of Sustainability in Higher Education*, **12** (1), 67-78.
- Lozano, R., R. Lukman, F. Lozano, D. Huisingh, and W. Lambrechts (2013), 'Declarations for sustainability in higher education: becoming better leaders, through addressing the university system', *Journal of Cleaner Production*, **48**, 10-19.
- McGibbon, C., & Van Belle, J. P. (2015). Integrating environmental sustainability issues into the curriculum through problem-based and project-based learning: a case study at the University of Cape Town. *Current Opinion in Environmental Sustainability*, **16**, 81-88.
- Nelson, M., W. Banks, and J. Fisher (2003), 'Improved accountability disclosures by Canadian universities', *Canadian Accounting Perspectives*, **2** (1), 77-107.
- O'Dwyer, B. and D.L. Owen (2005), 'Assurance statement practice in environmental, social and sustainability reporting: a critical evaluation', *The British Accounting Review*, **37** (2), 205-229.
- O'Dwyer, B., J. Unerman, and E. Hession (2005), 'User needs in sustainability reporting: perspectives of stakeholders in Ireland', *European Accounting Review*, **14** (4), 759-787.
- Oliver, C. (1991), 'Strategic responses to institutional processes', *Academy of Management Review*, **16** (1), 145-179.
- Platt, J. R. (1964), 'Strong inference', *Science*, **146** (3642), 347-353.
- Posner, S.M. and R. Stuart (2013), 'Understanding and advancing campus sustainability using a systems framework', *International Journal of Sustainability in Higher Education*, **14** (3), 264-77.
- Richardson, A.J. (2015) 'Models of Sustainability and Corporate Sustainability Reporting' *Odette School of Business Sustainability Symposium*.
- Rock, E. (2001), 'Securities regulation as lobster trap: a credible commitment theory of mandatory disclosure', *Cardozo Law Review*, **23**, 675.
- Rockstrom, J., W. Steffen, K. Noone, A. Persson, F. S. Chapin, III, E. Lambin, T. M. Lenton, M. Scheffer, C. Folke, H. Schellnhuber, B. Nykvist, C. A. De Wit, T. Hughes, S. van der Leeuw, H. Rodhe, S. Sorlin, P. K. Snyder, R. Costanza, U. Svedin, M. Falkenmark, L. Karlberg, R. W. Corell, V. J. Fabry, J. Hansen, B. Walker, D. Liverman, K. Richardson, P. Crutzen, and J.

- Foley (2009), 'Planetary boundaries: exploring the safe operating space for humanity', *Ecology and Society*, **14** (2), 32.
- Ronen, J. and V.L. Yaari (2002), 'Incentives for voluntary disclosure', *Journal of Financial Markets*, **5** (3), 349-390.
- Rosenbloom, D. (2010) 'Are Canadian universities taking sustainability seriously? A case study analysis of sustainability initiatives at three Canadian campuses and the lessons decision-makers can learn from these efforts', *ISEMA: Perspectives on Innovation, Science and the Environment, Forthcoming*, **5**, 1-24.
- Sahlin-Andersson, K. (2006), 'Corporate social responsibility: a trend and a movement, but of what and for what?', *Corporate Governance*, **6** (5), 595-608.
- Scott, W. R. (2003), 'Institutional carriers: reviewing modes of transporting ideas over time and space and considering their consequences', *Industrial and Corporate Change*, **12** (4), 879-894.
- Sedlacek, S. (2013), 'The role of universities in fostering sustainable development at the regional level', *Journal of Cleaner Production*, **48** (June), 74-84.
- Skouloudis, A., K. Evangelinos, and F. Kourmouis (2009), 'Development of an evaluation methodology for triple bottom line reports using international standards on reporting', *Environmental Management*, **44** (2), 298-311.
- Stafford, S. L. (2011). 'How green is your campus? An analysis of the factors that drive universities to embrace sustainability'. *Contemporary Economic Policy*, **29**(3), 337-356.
- Stiglitz, J. (2000), 'The contributions of the economics of information to twentieth century economics', *Quarterly Journal of Economics*, **115** (4), 1441-1478.
- Suchman, M. C. (1995), 'Managing legitimacy: strategic and institutional approaches', *Academy of Management Review*, **20** (3), 571-610.
- Thompson, R. and W. Green (2005), 'When sustainability is not a priority: an analysis of trends and strategies', *International Journal of Sustainability in Higher Education*, **6** (1), 7 – 17.
- Thorne, L., L. Mahoney, and G. Manetti. (2014) 'Motivations for issuing standalone CSR reports: a survey of Canadian firms', *Accounting, Auditing and Accountability Journal*, **27** (4), 686-714.
- Tolbert, P. S. (1985), 'Institutional environments and resource dependence: sources of administrative structure in institutions of higher education', *Administrative Science Quarterly*, **30** (1), 1-13.
- Velazquez, L., N. Munguia, A. Platt, and J. Taddei (2006), 'Sustainable university: what can be the matter?', *Journal of Cleaner Production*, **14** (9), 810-819.
- Velazquez, L., N. Munguia, and M. Sanchez (2005), 'Deterring sustainability in higher education institutions: an appraisal of the factors which influence sustainability in higher education institutions', *International Journal of Sustainability in Higher Education*, **6** (4), 383-391.
- Veltri, S., & Silvestri, A. (2015). The Free State University integrated reporting: a critical consideration. *Journal of Intellectual Capital*, **16**(2), 443-462.
- Wallage, P. (2000), 'Assurance on sustainability reporting: an auditor's view', *Auditing: A Journal of Practice & Theory*, **19** (s-1), 53-65.
- Wigmore, A. and M. Ruiz (2010), 'Sustainability assessment in higher education institutions. The stars system', *Ramon Lull Journal of Applied Ethics*, **1**, 25 - 42.

- Willis, A. (2003), 'The role of the global reporting initiative's sustainability reporting guidelines in the social screening of investments', *Journal of Business Ethics*, **43** (3), 233-237.
- Wilmschurst, T. D. and G.R. Frost (2000), 'Corporate environmental reporting: a test of legitimacy theory', *Accounting, Auditing & Accountability Journal*, **13** (1), 10-26.
- Wright, T. (2002), 'Definitions and frameworks for environmental sustainability in higher education', *International Journal of Sustainability in Higher Education*, **3** (3), 203-220.
- Wright, T. (2003), 'Guest editorial: special students' edition', *International Journal of Sustainability in Higher Education*, **4** (3), 208-209.

Table 1: Hypotheses regarding factors affecting the existence and quality of university sustainability reporting

Sustainability Reporting and sustainability performance		
H1 ⁸		there will be a U-shaped relationship between sustainability performance and the existence of sustainability reporting
	H1a	Low sustainability performers use sustainability reporting to manage social perceptions
	H1b	High sustainability performers use sustainability reporting to differentiate themselves
H2		there will be a positive relationship between sustainability performance and sustainability reporting quality
Sustainability reporting and stakeholder demands		
H3		there will be a positive relationship between stakeholder demands and the existence of sustainability reporting and report quality
	H3a	There will be a positive relationship between the decision to release a sustainability report and the presence of student sustainability clubs on campus
	H3b	There will be a positive relationship between the decision to release a sustainability report and the size of endowment funds held by the university
Sustainability reporting and strategic commitments		
H4		there will be a positive relationship between organizational strategy and the existence of sustainability reporting and report quality
	H4a	There will be a positive relationship between the decision to release a sustainability report and the university being a signatory on sustainability conventions
	H4b	There will be a positive relationship between the decision to release a sustainability report and the existence of teaching and research programs on sustainability at a university

⁸ All hypotheses are stated in alternative form and are ceteris paribus. For simplicity, where the relationship between factors and both the decision to report and the quality of the report is expected to be in the same direction, these two independent variables have been included in a single hypothesis but should be separated for testing; we are not implying a joint hypothesis. Where the relationship between factors and our two independent variables is expected to differ, they have been included in separate hypotheses.

Sustainability reporting and organizational capabilities		
H5		there will be a positive relationship between organizational capabilities and the existence of sustainability reporting and report quality
	H5a	There will be a positive relationship between the decision to release a sustainability report and the size of the university
	H5b	There will be a positive relationship between the decision to release a sustainability report and the existence of a sustainability office on campus
Sustainability reporting quality		
H6		The quality of a sustainability report will be positively related to the use of external assurance.
	H6a	The quality of a sustainability report will be positively related to the scope of the audit
	H6b	The quality of a sustainability report will be positively related to the reputation of the auditor
H7		The quality of a sustainability report will be positively related to the use of stakeholder engagement processes.

Table 2: Constructs and Measures to Explore Sustainability Reporting By Universities

Construct	Proxies	Example in Literature
Dependent Variables		
Release of a Sustainability Report	On-line date of release of a standalone sustainability document (or equivalent content)	Fonseca <i>et al.</i> (2011).
Quality of a Sustainability Report	External rankings	Greenreportcard.org
	Disclosure completeness (industry specific benchmark)	Recommended
Independent Variables		
Sustainability Performance	STARS rating	Wigmore and Ruiz (2010)
Stakeholder Demands	Student sustainability clubs on campus	Beringer (2006).
	Endowment funds	Recommended
Strategic Commitment	Sustainability Conventions signed	Bilodeau <i>et al.</i> (2014).
	Sustainability research and teaching programs	Jain <i>et al.</i> (2013).
Organizational Capabilities	Total university budget	Stafford (2011)
	Existence of a sustainability office	Rosenbloom (2010).
Assurance	Use of external assurance	Recommended
	Scope of the audit	Recommended
	Reputation of the auditor	Recommended
Stakeholder Engagement	STARS Engagement scores	Wigmore and Ruiz (2010)

Figure 1: Sustainability Performance versus the Quality of Sustainability Reporting⁹

		Quality of Sustainability Reporting (valid disclosure of sustainability performance)	
		Lo	Hi
Sustainability Performance	Hi	Hidden Gems	Sustainability Leaders
	Lo	Sustainability “Lemons”	Honest Laggards

⁹ This Figure is based on a standard brand positioning logic. Similar work can be seen in commercial reports, e.g. <http://www.sustainabilityleadershipreport.com/> and <http://www.digitalistmag.com/innovation/the-innovation-index-028510> accessed Oct. 2015.

Appendix A: STARS Performance Dimensions

INSTITUTIONAL CHARACTERISTICS

- IC-1: Institutional Boundary
- IC-2: Operational Characteristics
- IC-3: Academics and Demographics

ACADEMICS

CURRICULUM

- AC-1: Academic Courses
- AC-2: Learning Outcomes
- AC-3: Undergraduate Program
- AC-4: Graduate Program
- AC-5: Immersive Experience
- AC-6: Sustainability Literacy Assessment
- AC-7: Incentives for Developing Courses
- AC-8: Campus as a Living Laboratory

RESEARCH

- AC-9: Academic Research
- AC-10: Support for Research
- AC-11: Access to Research

ENGAGEMENT

CAMPUS ENGAGEMENT

- EN-1: Student Educators Program
- EN-2: Student Orientation
- EN-3: Student Life
- EN-4: Outreach Materials and Publications
- EN-5: Outreach Campaign
- EN-6: Employee Educators Program
- EN-7: Employee Orientation
- EN-8: Staff Professional Development

PUBLIC ENGAGEMENT

- EN-9: Community Partnerships
- EN-10: Inter-Campus Collaboration
- EN-11: Continuing Education
- EN-12: Community Service
- EN-13: Community Stakeholder Engagement
- EN-14: Participation in Public Policy
- EN-15: Trademark Licensing
- EN-16: Hospital Network

OPERATIONS

AIR & CLIMATE

- OP-1: Greenhouse Gas Emissions
- OP-2: Outdoor Air Quality

BUILDINGS

- OP-3: Building Operations and Maintenance
- OP-4: Building Design and Construction
- OP-5: Indoor Air Quality

DINING SERVICES

- OP-6: Food and Beverage Purchasing
- OP-7: Low Impact Dining

ENERGY

- OP-8: Building Energy Consumption
- OP-9: Clean and Renewable Energy

FOUNDATIONS

- OP-10: Landscape Management
- OP-11: Biodiversity

PURCHASING

- OP-12: Electronics Purchasing
- OP-13: Cleaning Products Purchasing
- OP-14: Office Paper Purchasing
- OP-15: Inclusive and Local Purchasing
- OP-16: Life Cycle Cost Analysis
- OP-17: Guidelines for Business Partners

TRANSPORTATION

- OP-18: Campus Fleet
- OP-19: Student Commute Modal Split
- OP-20: Employee Commute Modal Split
- OP-21: Support for Sustainable Transportation

WASTE

- OP-22: Waste Minimization
- OP-23: Waste Diversion
- OP-24: Construction and Demolition Waste Diversion
- OP-25: Hazardous Waste Management

WATER

- OP-26: Water Use
- OP-27: Rainwater Management
- OP-28: Wastewater Management

PLANNING & ADMINISTRATION

COORDINATION, PLANNING & GOVERNANCE

- PA-1: Sustainability Coordination
- PA-2: Sustainability Planning
- PA-3: Governance

DIVERSITY & AFFORDABILITY

- PA-4: Diversity and Equity Coordination
- PA-5: Assessing Diversity and Equity
- PA-6: Support for Underrepresented Groups
- PA-7: Support for Future Faculty Diversity
- PA-8: Affordability and Access

HEALTH, WELLBEING & WORK

- PA-9: Employee Compensation
- PA-10: Assessing Employee Satisfaction
- PA-11: Wellness Program
- PA-12: Workplace Health and Safety

INVESTMENT

- PA-13: Committee on Investor Responsibility
- PA-14: Sustainable Investment
- PA-15: Investment Disclosure

INNOVATION

- IN-1: Innovation 1
- IN-2: Innovation 2
- IN-3: Innovation 3
- IN-4: Innovation 4